

Chapter 6

Simulations

6-0. Chapter Overview.

Introduction a. This chapter provides information concerning the use of simulations for lane training.

Chapter Index b. This chapter covers the following:

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6-1. General.

Enhance Training a. The effectiveness of lane training can be dramatically enhanced through the use of **simulations and simulators during lane training planning and execution.**

- The Army's training goal is to execute tough and realistic training exercises as the primary means of training. However, decreasing resources, increasing weapons system ranges and lethality, and environmental constraints can limit the ability to train.
- Although TADSS are generally used to supplement live training, TADSS can provide the trainer with mission rehearsal capabilities and options to train segments of the force to standard before entering a high resource or safety constrained environment.
- Simulators and simulations can be used both to prepare for an exercise and to conduct an exercise.

Note: Due to safety or environmental issues or constraints hampering the use of live or constructive simulations, it may be more effective to conduct an LTX's lane execution using a virtual simulation.

Definitions b. Following are important definitions:

System	A set or arrangement of things so related or connected as to form a unity or organic whole. Also a set of facts, principles, or rules classified or arranged in a regular or orderly form so as to show a logical plan linking the various parts.
Model	A representation of a system.
Simulation	The operation or exercise of a model of a system.
Simulator	A physical model and simulation of a weapons system or piece of equipment that is not a prototype, but which replicates some major aspects of the equipment's operations. It may include elements of embedded computer hardware and software associated with these operations. The linking of two or more simulators in a common, interactive scenario is one kind of simulation.

Description of Simulation	c. A simulation is a representation or imitation of reality. Simulating part of a system, simulating the operation of a system, and simulating the environment in which a system will operate are three common types of simulations.
Description of Simulator	d. A simulator is a training device, machine, or apparatus which emulates or synthetically reproduces the functions and environment of an actual process, equipment, or system. A training simulator is a relatively complete item of training equipment which uses electronic or mechanical means to reproduce conditions necessary for an individual or a crew to practice operational tasks in accordance with training objectives. It represents the operational equipment physically and functionally to varying degrees.
Benefits	e. The use of simulators and simulations in lane training provides the following benefits: <ul style="list-style-type: none"> • Increases safety of the force by reducing safety hazards; e.g., eliminates lethality in weapons systems (since weapons' effects are simulated). • Reduces or avoids environmental damage. • Increases realism, since high cost or dangerous activities can be simulated rather than not performed at all. • Saves time and cost in moving personnel and equipment to distant training sites. May even be able to avoid moving equipment. • Reduces demand for training areas, maneuver space, and ranges. • Increases ability to-- <ul style="list-style-type: none"> • Integrate command and control, communications, and intelligence systems. • Train combined and joint force operations. • Follow doctrine and train units to function as they would during military operations. • Measure accomplishment of training objectives. • Rapidly change and restart scenarios. • Employ and evaluate new equipment and doctrine.

6-2. Types of Simulations.

Types of Simulations	a. There are three types of simulations: <ul style="list-style-type: none"> • Live. • Virtual. • Constructive.
Live Simulations	b. Live simulations permit combatants to use real or surrogate tactical systems to conduct training exercises at homestations, major training areas, and the CTCs.
Definition	Live simulation - A representation of military operations using military personnel and equipment to simulate experiences achieved during actual combat conditions.

Description	Live simulations are associated with operational testing, field exercises, training exercises, and force-on-force and force-on-targetry exercises. Live simulations include training events where soldiers physically deploy as units (usually against an OPFOR) and use simulators (e.g., weapons simulators) to replicate certain parts of combat. Live simulations can take place almost anywhere the maneuver space is available. The simulators used often replicate weapons systems interaction and damage.
Examples	<ul style="list-style-type: none"> • CTCs. • Multiple Integrated Laser Engagement System (MILES). • Precision Range Integrated Maneuver Exercise (PRIME). • Air Ground Engagement System II (AGES II).
CTCs	The CTCs are designed to provide joint service and combined arms training under realistic battlefield conditions. The CTCs include the National Training Center, Joint Readiness Training Center, and Combat Maneuver Training Center.
MILES	MILES is a family of training simulators which simulate the effects of direct-fire weapons at their operational ranges and operates in a fully integrated tactical training environment.
PRIME	PRIME is an infantry and armor tactical trainer or simulator which trains fire and maneuver, command and control, target detection, identification, and engagement.
AGES II	AGES II is an air defense simulator which simulates vulnerability and weapon characteristics to include weapon effects.
Application	LTXs can use tactical engagement simulation methodology and supporting TADSS such as MILES to simulate combat under force-on-force or force-on-targetry task performance conditions. MILES permits the simulation of weapons' casualty-producing effects in player real time and on actual terrain.
Virtual Simulations	c. Virtual simulations are used with distributed and interacting manned simulators to support individual, crew, and unit collective training on a common synthetic battlefield.
	Definition Virtual simulation - A synthetic representation of warfighting environments patterned after the simulated organization and operations of actual military units. Differences in the representation of the simulated battlefield (i.e., whether real world, computer generated, or interactive players in simulators) are transparent to the participants who interact with their particular representation of the warfighting environment.

Description	Virtual simulations are often associated with crew-served weapons systems and focus on training devoted to emphasize familiarity, practice, and skill. These simulations are simulators that closely replicate all or part of tanks, armored personnel carriers, aircraft, and other equipment. They are often referred to as simulators because they are either a single part or complete replicas of individual or crew-served weapon systems, vehicles, and crafts.
Examples	<ul style="list-style-type: none"> • Conduct of Fire Trainer (COFT). • AH-64 Combat Mission Simulator (AH-64 CMS). • Close Combat Tactical Trainer (CCTT). • Aviation Combined Arms Tactical Trainer (AVCATT). • Fire Support Combined Arms Tactical Trainer (FSCATT). • Engineer Combined Arms Tactical Trainer (ENCATT).
COFT	The COFT is a stand-alone tank gunnery simulator.
AH-64 CMS	AH-64 CMS is a pilot and copilot/gunner cockpit simulator used to train individual and crew gunnery tasks.
CCTT	CCTT is a simulation which networks simulated infantry and armor combat vehicles, weapons systems, and command and control elements.
AVCATT	AVCATT is an aviation simulation which trains and sustains individual, crew, collective, and combined arms skills.
FSCATT	FSCATT is a simulation used to train the field artillery gunnery team: the forward observer, fire direction center, and howitzer crew.
ENCATT	ENCATT is an engineer simulation used to train individual and collective combat engineer tasks.
Application	<ul style="list-style-type: none"> • Major constraints for conducting lane training include restrictions on and shortages of local training areas. To avoid these constraints, virtual simulations permit the simulation of the battlefield including both weapons' casualty-producing effects and terrain. • Using virtual simulations, it may be possible for units without nearby training areas to prepare for or participate in an LTX without leaving their unit's post or homestation.
Constructive Simulations	d. Constructive simulations use computer models to conduct exercises that allow man-in-the-loop input to support command and control training.
Definition	Constructive simulation - A wargame, model, or analytical simulation that typically involves aggregated software representations of units, their behavior, and associated outcomes.

Description	Constructive simulations are usually identified with large scaled, complex computer-driven models associated with exercises dealing with battalions, brigades, divisions, corps, and echelons above corps. The primary training audience is the commander, subordinate commanders, and battle staffs associated with that echelon of command. Adjacent, higher, and lower units are “played” in computer workstations transparent to the primary training audience.
Examples	<ul style="list-style-type: none"> • SPECTRUM. • JANUS (Battle-Focused Trainer). • Brigade/Battalion Battle Simulation (BBS). • Corps Battle Simulation (CBS). • Tactical Simulation (TACSIM). • Combat Service Support Training Simulation System (CSSTSS). • Warfighters’ Simulation (WARSIM) 2000.
SPECTRUM	SPECTRUM is a simulation which trains squad through strategic collective tasks associated with a wide spectrum of military operations.
JANUS	JANUS is the Army’s battle-focused training simulation for leader development at company and team level. JANUS trains current tactics and doctrine to company level officers and NCOs via a wargaming system which models both friendly and enemy weapons systems.
BBS	BBS is a battle simulation for command post exercises. BBS supports the collective training of the commander, battle staff, command posts, and headquarters of CA and CS battalions and brigades.
CBS	CBS is a simulation which supports training of the corps commander, battle staff, major subordinate commands, and major subordinate elements’ headquarters in the conduct of deep operations.
TACSIM	TACSIM is the intelligence driver for CBS. It trains corps and division command posts and their associated military intelligence assets.
CSSTSS	CSSTSS is a simulation used to provide training for CSS commanders and staffs from theater Army to battalion level.
WARSIM 2000	WARSIM is a simulation used to support the training of unit headquarters, command posts, and battle staffs (from battalion through theater levels) in joint and combined scenarios.

Application	Constructive simulations can be used during pre-LTX and post-LTX training to enhance skills and proficiency.
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Note: Although BBS is not normally associated with company-level training, BBS can be used to train brigade or battalion staffs while other units are participating in lane training. Also, company-level participants in BBS can enhance the unit's ability to execute LTXs.

6-3. Simulations and Lane Training.

Training Simulation	<p>a. Effective lane training replicates the environment of military operations. Although lane training can be conducted as either a live, virtual, or constructive simulation, it is normally conducted as a live simulation (i.e., conducted in the field or job site environment). However, due to safety or environmental constraints hampering the use of live or constructive simulations, it may be more appropriate or effective to conduct an LTX using a virtual simulation. The use of live, virtual, or constructive simulations to prepare for or to conduct lane training can dramatically enhance its effectiveness; however, their use normally requires very long-range planning.</p>
Mutual support	<p>b. Lane training and simulations complement each other. Live, virtual, or constructive simulations can be used to prepare for an exercise (pre-LTX training and verification, training validation, or rehearsals) or as a way of conducting an exercise (LTX rehearsals, lane execution, retraining). The opposite also is true; an LTX can be used to prepare for other simulation exercises.</p>
Example Simulation	<p>c. An example of how virtual simulation could be employed during an LTX for a selected METL task is as follows:</p> <ul style="list-style-type: none"> • The unit assembles at the LTX area (a virtual simulations training area). • The OC reviews the task with the unit and shows how the task could be performed (perhaps using a recording of a previous lane execution). • The unit rehearses the task, eventually employing a virtual simulation for a “dry run.” • The unit executes the lane using the virtual simulation. • The OC conducts (or facilitates) an AAR addressing unit performance. • The unit retrains using a virtual simulation until it can execute the lane to standard. <p>Note: The unit must complete prerequisite training prior to reporting for the LTX (this could also be conducted using virtual simulations).</p>
Integrate TADSS	<p>d. Exercise planners should integrate simulations, simulators, and other TADSS into their lane training process. Simulations and simulators can dramatically increase the effectiveness of training while simultaneously reducing training costs.</p>
